Al-Waha International Language Schools



Prep.2

First Term

2017 – 2018



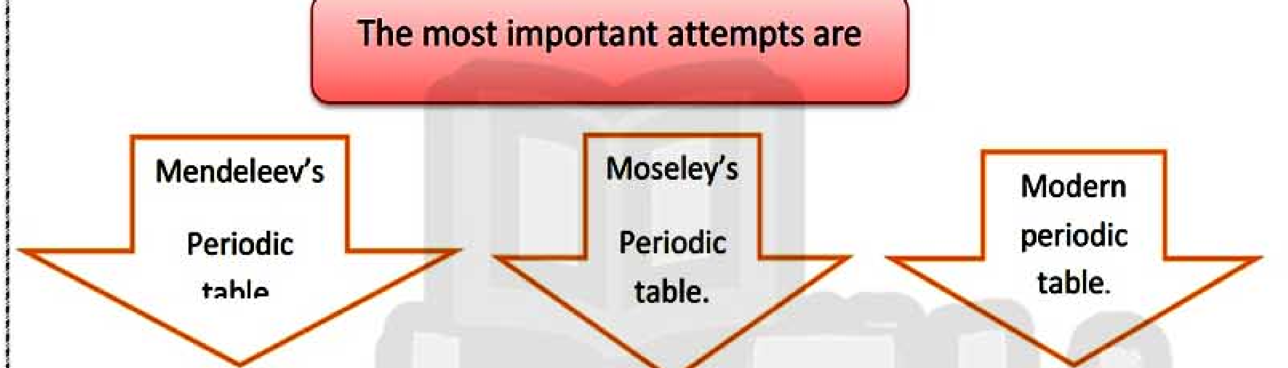


Attempts of elements classification

By increasing the number of discovered elements, scientists classified them according to their properties in order to :

-facilitate their study.

-find a relationship between elements.



Mendeleev's table:

Mendeleev arranged element according to atomic weight.

Mendeleev prepared 67 cards each element represented an element.

He arranged element of similar properties in vertical columns which were known later as groups.

atomic weight from left to right in horizontal row(periods)

Advantage of Mendeleev's table:

-He left gaps in his table to predict a new elements.

-He corrected the atomic weight of some elements .

Disadvantage of Mendeleev 's table :

-He had to make disturbance in the ascending order of atomic weight of some elements.

-He had to deal with the isotopes of one element as different elements.

Isotopes : they are element have different atomic weight and same atomic number.

Moseley 's periodic table.

The English scientist Moseley discovered after x- rays

Element are related to their atomic number.

-He arranged element in an ascending to their atomic number.

-He added zero group which includes inert to the table.

-He specified a place below the table for lanthanides and actinides elements .

NOTE: The newzealand scientist Rutherford discovered the nucleus of the atom contains positively charged protons.

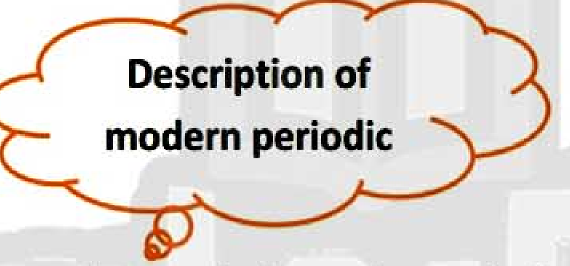
Modern periodic table

The Danish scientist Bohr had discovered the main energy levels of the atom and their number reaches 7 in the heaviest atoms.

-elements are classified in the modern periodic table in an ascending order to

***their atomic number.**

***The way of filling the energy sublevels with electron.**



-The no. of known elements in the modern periodic table till now is 118 elements,92 elements are available in earth's crust.

-The modern periodic table consists of :

-7 horizontal periods and 16 vertical groups(18 column).

S-block elements	P-block elements	d-block elements	f- block elements
Located on the left side.	Located on right side.	Located on the middle	Located below the periodic table
They are arranged ed in	They are located on right side in six	Arranged in 8 groups	They are located below

two groups 1A ,2A	groups 3A,4A,5A,6A,7A and zero group.	3B,4B,5B6B,7B 8 1B,2B	the periodic table
		They are known as transition elements.	The include lanthanides and actinides.
		They appear to start from period 4	

How to locate the position of an element:

The element period number = no of energy levels occupied by electron.

The element group number = no of electron in outermost energy level.

Example : the electronic configuration of neon Ne_{10}





Elements of the same group	Element of the same period
They are similar in the no of electrons in the outermost energy level they are similar in their chemical properties.	differ
They are different in the number of energy levels occupied by electron.	similar

Work sheet

1-Calculate the atomic number of the following elements:

1-An element is located in 1st period and group 1A

....

2-Locate the position:

1-Neon Ne_{10} 2-calcium Ca_{20} 3-H_1

Choose the correct answer:

1- The scientist who left vacancies in his table to be filled with suitable discovered elements in the future is ....
   a- Moseley b- Rutherford c- Bohr d Mendeleev.
2- The scientist who discovered that the nucleus of atom contains positively charged proton is ....
   a-Moseley b- Rutherford c- bohr d Mendeleev.

3- The scientist who discovered the main energy levels is ....

a-Moseley b- Rutherford c- bohr d Mendeleev

4- The no of known elements in the modern periodic table till now is ....

a- 216 b- 118 c-316 d -16

5- The transitional element start to appear from beginning of the .... period.

a- Second b- third c- fourth d- fifth

6- The element , which occupy the middle block (d) in the periodic table are called .... Element.

a- Transition b- alkali c- alkaline earth d- noble gas

7- Which of the following belongs to the same group in the periodic table?

a- Na ,C b- Na Li c Na , Cu d- Na , Ne

8- The element whose atomic no (18) is ....

a- Transition b- inert c- halogen.

H .W

Give reason :

1-Mendeleev left gaps in his periodic table .

....

2- elements of same group have similar properties.

....

What is the scientific principle upon which the element are arranged in ;

1- Mendeleev's periodic table.

....

2- Moseley's periodic table .

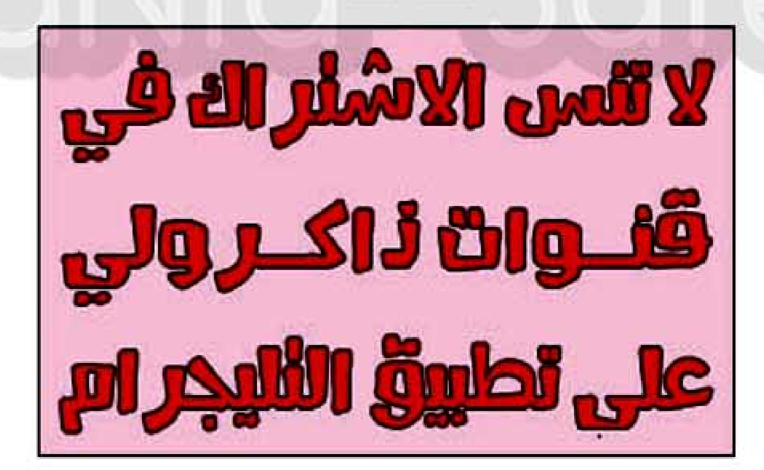
....

3- Modern periodic table.

....

Write the scientific term:

1- The block , that contains the series of lanthanides and actinids.
2- The block that contains the groups from (3A) to (7A).
3- A kind of elements symbolized by letter (b).
4- They indicated by letters s ,p d ,f.
5- They indicated by letters k,l,m,n,o,p,q.
6- The horizontal rows in mendeleev'table.
7- The vertical columns in mendeleev'table.



Lesson 2:

Graduation of the properties of elements in the modern periodic table

The graduation of some properties of the elements in periods and groups (A)

Such as:

1-Atomic size

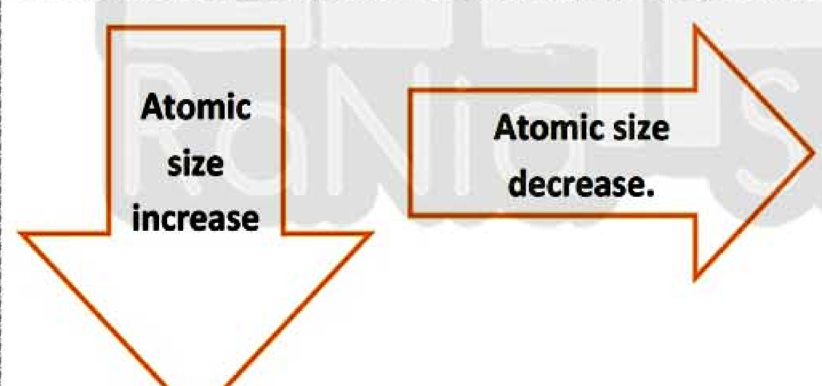
2-Electronegativity.

3-Metallic and non-metallic properties.

1-Atomic size:

-The atomic size is determined by known the atomic radius of the atom and its measuring unit is picometre (Pm).

Graduation of atomic size of elements in the periodic table:



In periods: by increasing the atomic number(from left to right),the atomic size decreases

Give reason: due to the increase in the attraction force between the positive nucleus and outermost electrons.

The atomic size of the elements of the same period is inversely proportional to the atomic number.

In groups: by increasing the atomic number (from up to down) the atomic size increase.

Due to the increase in the number of energy levels occupied by electrons.

The atomic size of elements of the same group is directly proportional to atomic number.

The largest atom of element in size is cesium the smallest one is fluorine.

2- electro negativity

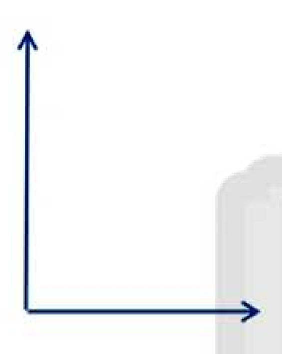
It is the ability of the atom in covalent molecule to attract the electron of the chemical bond towards itself

decrease

Electronegativity increase.

In periods :

By increasing the atomic number (from left to right) the electronegativity of the element of the same period is directly prop. To atomic number.



In groups: by increasing the atomic number the electronegativity decrease

The electronegativity of the element of the same group is inversely prop.



Fluorine (f) which have the highest electronegativity.

Note: E N between two element more than 1.7 (ionic bond)

,less than 1.7 covalent bond.

Polar compound:

They are covalent compound in which the difference in electronegativity between their element is relatively high.

Example:

Water molecule - ammonia molecule

Water molecule:

- The ability of an oxygen atom to attract the two electron of covalent bond towards is greater than the ability of hydrogen atom.

  Water is consider one of the polar covalent.

  Bec the difference in electronegativity between its elements is relatively high.

Ammonia molecule :

It consists of combination of one nitrogen atom with three hydrogen atoms.

The ability of a nitrogen atom to attract the two electrons of the covalent bond towards it, is greater than that of a hydrogen.

Ammonia is considered one of the polar covalent compound .

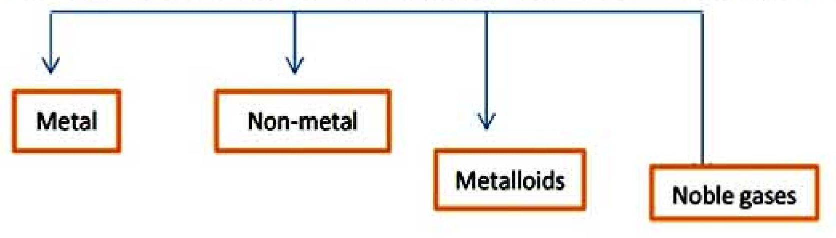
Bec the difference in electronegativity between its elements is relatively high.

Polar compound	Non-polar compound
it is a covalent compound the electronegativity between its elements is relatively high	it is a covalent compound the electronegativity between its elements is relatively low.
water molecule H_2O **o= 3.5 H= 2.1** **3.5 – 2.1 = 1.4** **Ammonia molecule** **n=3 h=2.1** **3 – 2.1 = 0.9**	Methane gas molecule CH_4 c = 2.5 H = 2.1 2.5 – 2.1 = 0.4 Hydrogen sulphide H_2S S = 2.5 H = 2.1 2.5 – 2.1 = 0.4

- The covalent bond is described as a pure bond when the electronegativity difference between the atoms equal zero (oxygen molecule O_2)

Metallic and non-metallic property

Element in the periodic table are classified into four main kinds:



1- Metal:

They are the elements which have less than four electrons in their outermost energy levels

2-Nonmetal:

They are the elements which have morethan four elements.

Metallic elements tend to gain their outermost electron and change into negative ions to reach to nearest noble gas. Electrons in their outermost energy levels.

3-Metalloids :(semi metal)

They are the elements which have the properties of both metal and non metal.

Graduation of metallic and non metallic property in the periodic table.

- In periods :
  Starts with strong metal by increasing the atomic number:
  The metallic property decrease till we reach metalloid.
  Then the nonmetallic property appears and increase till reach the strongest nonmetal and end in inert gas.

Metallic property decrease.

In groups:

A-In metallic groups:

The metallic property increase gradually as we go from top to bottom as group(1A)Bec the atomic size increases

Metallic property increase

Cs is the most metallic

Li is the least metallic

B- In non metallic

Non metallic property decrease

The nonmetallic property decrease gradually

as we go from top to bottom in group(7A)

Bec the decrease in electronegativity.

The elements of this group are arranged descending according to the graduation of nonmetallic property.

F the strongest nonmetal.

I is the least nonmetal element.

- The atomic size decrease. *The electronegativity increase.
- The metallic property decrease * The non metallic property increase.

*The atomic size increase.

*The metallic property increase.

*The electronegativity decrease.

Chemical properties of metal:

1- Reaction of metals with dilute acids:

A-Some active metals such as Mg,Zn react with dilute acids giving salt of acid and hydrogen gas is evolved.

$Mg + 2HCl \longrightarrow MgCl_2 + H_2$

B-Inactive metals such as copper don't react with dilute acid.

Cu + HCl ⟶ no reaction .

2-Reaction of metals with oxygen:

Some metal react with oxygen giving metal oxides which called basic oxides.

$2Mg + O_2 \longrightarrow 2MgO$

$MgO + H_2O \longrightarrow Mg(OH)_2$

3-Reaction of metal with water

Chemical activity series:

It is a series in which metals are arranged in decending order. according to their activity

Metal	Reaction with water
Potassium sodium	React quickly with water and hydrogen gas evolves burn with pop sound.
Calcium magnesium	They react very slowly with cold water.
Zinc iron	They react with hot water at high temp.
Copper silver	They don't react with water.

metal	nonmetal
React with HCl $Mg + 2HCl \longrightarrow MgCl_2 + H_2$	No reaction
React with oxygen $2Mg + O_2 \longrightarrow 2MgO$ $MgO + H_2O \longrightarrow Mg(OH)_2$	$C + O_2 \longrightarrow Co_2$ $CO_2 + H_2O \longrightarrow H_2CO_3$
Basic oxides: Metal oxide some of them dissolve in water forming alkaline solution.	**Acidic oxides:** Nonmetal oxide dissolve in water forming acidic solution.

- Aluminum oxide are known as amphoteric oxide

  They can react with acid and base.

worksheet:

Q (1): Choose :

1- The 3rd period starts with elements their oxides are as following:
-Acidic , amphotric , basic
-Acidic , basic , amphotric
-Basic , acidic , amphotric
-Basic , amphotric , acidic

2- In the same period the elements which have the highest electro-negativity lies in group
(0 - 7A - 2A - 1A)



3-When sodium react with water …………………… gas evolves.

(O_2 - CO_2 - H_2 - N_2)

4-Metal oxides are ……………………. Oxides.

(acidic – basic – amphotric – neutral)

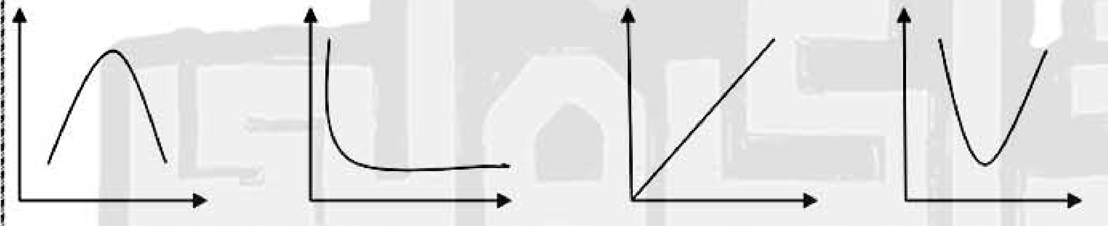
5-When magnesium oxide react with water …………………….. is produced which turns the litmus solution into ………………………… .

($Mg(OH)_2$ - MgO - MgCl - HCl)

6-Zinc and iron react with water only in ………………………… temperatures.

(low - high - medium - no correct answer)

7-Which of the following figures represent the graduation in electro-negativity in the second period



Q (2) : Complete :

1- The polar compound is a ………………… Compound, the electro-negativity difference between its elements is relatively ……………………………… .
2- The atomic size of Na element is ………………………… than the atomic size of P element (they are in the same period).
3- Each period in the modern periodic table starts with ……………………… element and ends with ……………………………… element.
4- By increasing the atomic number , the value of mass number will ……………………… in period of the periodic table.
5- The strongest non-metal elements are in the ……………………… Group.

Q(3) : Write the scientific term :

1- The ability of the atom in the covalent molecule to attract the electrons towards itself. (..)

2- A kind of elements in which their valency shell contain less than 4 electrons. (..)

3- A kind of oxides that react as acidic or basic oxides according to the reaction conditions. (..)

4- A kind of elements which has more than 4 electrons in its outermost shell(..)

5- Covalent compounds in which the difference between the electro-negativity of its elements is relatively low. (...)

H.W

Q (1): Give reasons for :

1- Fluoride is considered from the strongest non-metallic elements.

....

....

2- By increasing the atomic number of the elements their atomic weight decreases..

....

....

3- The increasing in the atomic size gradually in groups.

....

....

4- Aluminum oxide is considered as amphotric oxide.

....

....

5- Sulfur dioxide is considered as acidic oxide.

....

....

: Explain with chemical reaction (if found);

1- The behavior of iron, silver potassium in water.
2- Reaction between carbon (C) and hydrochloric acid HCl.
3- Reaction between (Mg) magnesium and HCl.
4- Reaction between (Mg) magnesium and oxygen (O_2).
5- Reaction between water (H_2O) and carbon dioxide (CO_2)





Lesson three:

Main groups in the modern periodic table

Alkali metal (group(1A))	Alkaline earth metals (group(2A))	Halogen (group(7A))
Located on left side of modern periodic table.(first group)	Located on left side of modern periodic table.(second group)	Located on right side of modern periodic table before inert gas in block p (7A)
Li_3 Na_{11} K_{19} Rb_{37} Cs_{55} Fr_{87}	Be_4 Mg_{12} Ca_{20} Sr_{38} Ba_{56} Ra_{88}	F_9 Cl_{17} Br_{35} I_{53} At_{85}
They are good conductor of heat and electricity.	They are good conductor of heat and electricity.	They are mono-valent elements because their outer most energy have 7 electron.
Most of them have low density.		They tend to gain one electron during chemical

Li,Na,K float on water as their density less than water Rb,Cs elements sink in water their densities are greater than water.	Their densities are higher than alkali metal density Ca is least density ,Br is the most density. All alkaline earth metals sink in water.	reaction and convert into negative ion $M \longrightarrow M^{-}$
They are mono-valent because they have one electron. They tend to lose and fuming positive ion.	They are divalent they have two electron in outermost energy levels. They tend to lose their valency and foming positive ions . $M \longrightarrow M^{2+}$	They exists in the form of diatomic molecules (formed of two atom) Their physical states is graduated from gas to liquid to solid
They are active element they are kept under surface of kerosene Their chemical activity increase	The chemical activity of these elements is less than alkali metal activity.theyare not kept under	They are active elements they are found combing with other element Exept At prepared They react with metal forming salt so they are

as atomic size increase Cs is most active metal. They are named alkali metal as their elements react with water forming alkaline solution.	the surface of kerosene. Their chemical activity increase as their atomic size increases bec. The loss of two valancy electrons becomes easier. Ba more active thanCa more active than Mg.	called halogen (forming salts) $2K+Br_2 \rightarrow 2KBr$ Each element replaces the element below it in its salt solution. $Cl_2+2KBr \rightarrow 2KCl_2+Br_2$ $Cl_2+2KI \rightarrow 2NaCl+Br_2$ $Br_2+2KI \rightarrow 2KBr+I_2$

Properties of element and their uses:

element	Its uses
Na	It is used in liquid state in transferring heat from inside the nuclear reactor to outside(heat used in generate electricity)
Cobalt	Its is used in food preservation Bec. It emits gamma rays which prevent the reproduction of microbes.
silicon	Used in manufacture of electronic device(bec it is semi conductor)
Liquefied nitrogen	It is used in preservation of cornea of eye due to the decrease in its boiling point(-196C)

worksheet:

Q (1): Choose :

1- ………………………………… Is used in food preservatives.
(chlorine – liquefied nitrogen – iodine – radioactive cobalt 60)
2- The reaction of ……………………………….. with water is considered stronger than the reaction of Na sodium in water. (Cl - K - C - Br)
3- The halogen elements belong to group…………………..
(1A - 2A - 6A - 7A)
4- The strongest alkali earth's metals in reaction with water is ……………………..
(Mg - Ca - Ba - Na)
5- ……………………… is considered from halogens.
(Sodium – Chlorine – Helium – Calcium)

H.W

Q (1): Give reasons :

1- Elements of group (1A) is called alkali metals.

……

2- Silicon slides used in the manufacturing of computers.

……

3- Coal is used in getting rid of the odour of the refrigerator.

……

4- The chemical activity of the alkali earth's metals increases with the increasing in atomic size.

……

5- Liquefied nitrogen is used in the preservation of eye cornea.

……

6- Sodium and potassium are kept under kerosene or paraffin.

....

Q (2) : What is the symbol which represents :

1- The most active metal.
2- The most active non-metal.

Q (3) : Show by balanced equations :

1- The reaction between sodium (Na) and water(H2O).
2- The reaction between chlorine (Cl) and potassium bromide (KBr).
3- The reaction between sodium (Na) and bromine (Br).

Lesson 4

Water

Sources of water:

Waterareas (river,oceons and seas)

Rains wells springs

B-chemical properties of water

1-weakness of water ionization:

Ionization:

It is process of converting the molecules into ion.

- Pure water is consider a weakly ionized material.
- $H_2O \longrightarrow H^+ + OH^-$

2- Water has a neutral effect on litmus paper:

Bec. When it ionzes,it gives equal number of

Positive hydrogen ion which are responsible for the acidic property.

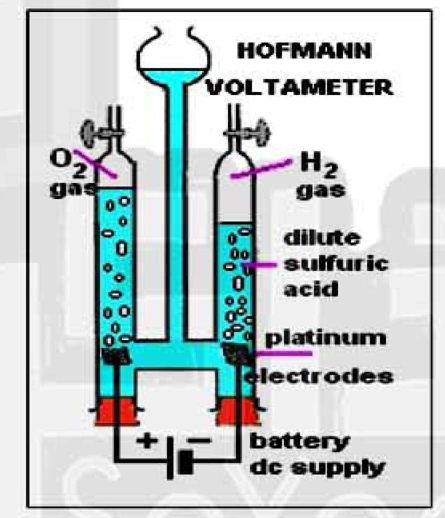
Negative hydroxide ion which are responsible for the basic property.

3-**Resistance of water to decomposing:**

Water doesn't decompose into element (oxygen, hydrogen) under normal condition or even by the effect of heat.

This property helps to keep the aqueous solution inside the cell of living.

The idea of work of the Hoffman's voltmeter which is used for the electrolysis of acidified water.



During electrolysis of acidified water by Hoffman's voltmeter,oxygen gas evolves at the anode, while hydrogen gas evolves at the cathode.

Bec.oxygen ions are negatively charged so,oxygen gas evolves at the anode, while hydrogen ions are positively charged so hydrogen gas evolves at the cathode.

-Adding few drops of dilute sulphuric acid to water during its electrolysis by Hofmann's voltammeter.

Bec pure water is bad conductor of electricity ,but acidified water conducts electricity.

Water pollution:

It is the addition of any substance to water which causes continuous change in water

Environmental pollutants can be divided

1-Natural   2- artificial

1- **Natural pollutants**:

-volcanic eruption.

-death of living

-lightning accompanying thunder storms.

2-**Artifcial pollutants:**

Burning coal

Types of water pollutions:

Kind of pollution.	Its causes (origin)	Its harms (damage)
1-biological pollution.	Mixing animal and human wastes with water.	The infection by many diseases such as bilharzia, typhoid and hepatitis.
2-Chemical pollution	Discharging factories and sewage in seas.	Eating fish which contain high concentration of **lead** causes the death of brain cells. **Mercury** causes blindness. **Arsenic** increasing the infection rate by liver cancer.
3-thermal pollution	Increasing the temp.(used in cooling the nuclear reactors.	Death of marine creatures due to the separation of dissolved oxygen from water.
2- Radiant pollution	Dumping the atomic wastes in seas.	Increase in incidence of cancer.

Protection of water from pollution:

1-Preventing or getting rid of sewage, wastes of factories and dead animal in river.

2-Developing the stations of water purification.

3-disinfection of the drinking water tanks in periodical manner.

4-don't store the tap water in empty plastic bottles.

Bec plastic reacts with chlorine gas leading to the increase in the infection rates by cancer.

5-spreading environmental awareness among people to protect water from pollution.

worksheet :

Q. (1): Choose from (B) what suits (A) column:

(A)	(B)
Probably harm	Responsible pollutant
1- Death of brain cells. 2- Cancer of liver. 3- Blindness.	1- Lead 2- Sodium 3- Mercury 4- Arsenic

<u>**H.W**</u>

Q. (1): Give reasons:

1- Presence of hydrogen bonds between water molecules.

....

2- Pure water doesn't affect litmus papers.

....

3- Although sugar is a covalent compound, it dissolves in water.

....

4- Tap water should not be stored in plastic bottles of mineral water.

....

5- Water has a high boiling and freezing points.

....

Q. (2): What's meant by:

1- Water pollution.
2- The latent heat of fusion.
3- Ionization.

Q. (3): How do we keep water from pollution?

....

Q. (4): What is the effect of the following on the water environment:

1- Drainage of factories wastes in rivers and seas.
2- Using of rivers and seas water for cooling the nuclear reactors.
3- Mixing of animal and man wastes with water.

Unit 2

The atmosphere and protecting planet earth

Lesson1

The atmospheric layer.

Atmospheric envelope of earth:

It is a gaseous envelope rotating with the earth around its axis and it extends about 1000Km above sea level .

Atmospheric pressure:

It is the weight of air column of an atmospheric height on unit area.

Normal atmospheric pressure:

It is the atmospheric pressure at sea level and it equals 1013.25mb.

1 bar = 1000 millibar.

The instruments of measuring the atmospheric pressure:

Aneroid: types of barometers

It is used to determine the possible day weather.

Altimeter: used by pilots to measure the elevation.

Atmospheric pressure maps:

Atmospheric maps:

They are maps in which the point of the same pressure are connected together by curved lines called isobar.

Isobar: it is curved lines that join that points of equal pressure in the atmospheric pressure maps.

Layer of atmospheric envelope

1- Troposphere
2- Stratosphere
3- Mesosphere
4- Thermosphere

There is region between each two successive layer the temp. remains constant.

1-tropopause :region between troposphere and stratosphere.

2-stratopause: region between stratosphere and mesosphere.

3-mesopause : region between mesosphere and thermoshere.

troposphere	stratosphere	mesosphere	thermosphere
First layer it means the disturbed layer all weather changes take place in it.	Second layer it is called the ozonic atmospheric envelope	Third layer of atmospheric envelope The coldest layer.	Fourth layer it called thermal layer bec it is the hottest layer.
Thickness of troposphere is 13 Km	Thickness of this layer is 37 Km	Thickness of this layer is 35 Km.	Thickness of this layer 590Km.
Temp. layerdecrease at rate(6.5^{0}c)it reach to-60^{0}c	Temp. increase until reach (0^{0}c) Due to absorption of u.v.	Temp. decreases at a high rate as we go up until it reach -90	Temp increase as we go up until it reach 1200^{0}c
The atmospheric pressure decrease as we go up until it become 100mb at its top100=0.1bar from the normal.	1mb=0.001bar from the normal.		Contains charged ions
It contain 75% of mass of the atmospheric air all phenomena accur on it .it contains 99% of atmospheric water vapour.	It contain most of ozone gas which is found in atmospheric at height of 20:40km	It contain limited quantities of helium and hydrogen(vacuumed) (highly rarefied)	
Air movement is vertical.	The lower part of such layer doesn'tcontain cloud or weather disturbance and the air movement is horizontal so pilots prefer to fly their planes in this layer.	It protect the planet earth from celestial rocky where they burn as a result of their friction with air molecules forming meteors.	

Ionosphere layer:

It is a layer that contains charged on and it has an important role in wireless communications.

Van-Allen belts:

They are two magnetic belts surrounding ionosphere and play an important role in scattering harmful charged cosmic radiations.

Aurora phenomenon:

It appears as bright colourful light curtain seen from the both poles

Importance: satellites orbit in exosphere are used to transmit weather information and tv programs

Worksheet:

Q. (1): choose:

1. Normal atmospheric pressure equals .... millibar.
   (1013.25 - 76 - 1.013 - 760)
2. .... Is located between stratosphere and mesosphere.
   (stratopause – tropopause – mesopause – thermosphere)
3. Meteors burn in ....
   (mesosphere – ionosphere – exosphere – stratosphere)
4. The hottest atmospheric layer is ....
   (troposphere – stratosphere – mesosphere – thermosphere)
5. The coldest atmospheric layer is ....
   (troposphere – stratosphere – mesosphere – thermosphere)
6. The device used in measuring the atmospheric pressure is ....
   (altimeter – aneroid – barometer – a and b)
7. The device used in measuring the altitude from the Earth's surface is ....
   (altimeter – aneroid – barometer – a and b)
8. The charged cosmic radiation are dispersed in the .... layer.
   (troposphere – stratosphere – mesosphere – thermosphere)

H.W

Q. (1): Mention the importance of the following device:

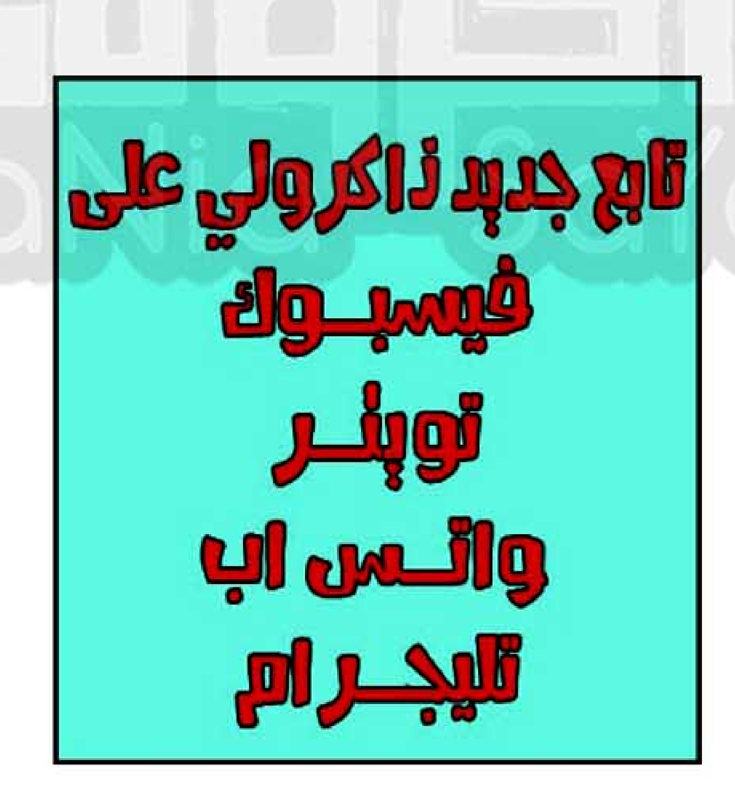
1. Van Allen Belts.
2. Altimeter.
3. Satellites.

Q. (2): What's meant by:

1. Atmospheric pressure.
2. The Aurora phenomenon.
3. Exosphere.

Q. (3): Give reasons:

1. The lower part of the stratosphere is suitable for plane flying.
2. The upper part of thermosphere is called ionosphere.
3. Rains, clouds and winds are in troposphere.
4. The upper part of stratosphere has relative high temperature than the lower part.



Lesson 2

Erosion of ozone layer and global warming

Position of ozone layer

Located at height 20:40Km

Structure ***of ozone layer:***

Consists of three oxygen atoms.

Formation of ozone gas:

1- Oxygen gas molecule absorbs u.v which causes the break down of the bond between the two oxygen atoms giving two free oxygen atom (2O)
   $O_2 \longrightarrow O+O$
2- Each oxygen atom combines with an oxygen molecules forming ozone molecule (O_3)
   $O+O \longrightarrow O_3$

Thickness of ozone layer:

20Km measuring unit is Dobson

Types of UV rays:

UV rays	Near UV	medium UV	Far UV
wavelength	315:400 nm	280:315nm	100:280nm
Range of penetration from ozone layer.	penetrate 100%	don't penetrate 95%	don't penetrate 100%

Harms of far and medium UV rays:

living organisms	**harmful effects**
human:	Increasing the rate of skin cancer. cataract. weakness of the immunity system.
amphibians:	Spoil eggs. decreasing the rate of reproduction.
marine	death of plankton. destroying the marine food chains.
Terrestrial plants:	Upset the photosynthesis process. shortage of crops.

Erosion of ozone layer:

Scientists have noticed that there was erosion of ozone layer above the south poles .this phenomenon is known as an ozone hole that increase in September.

Bec all pollutants are pushed by wind toward south poles.

Ozone holes:

It means thinning layer above the south poles.

Pollutants of ozone layer:

1-chorofluorocarbon compound(CFC_s)(Freon) -A cooling substance in air conditioning sets. - A propellant substance in aerosols. -A flatting substance in making foam backing. -A Solvent substance for cleaning electric circuits.
2-Methyl bromide gas: it is used as an insecticide.
3-Halons: they are used in extinguishing fires.
4-Nitrogen oxides: They are produce from the burning of fuel of ultrasound airplanes.(concorde)

The effect of chlorofluorocarbon:

Steps of erosion ozone layer	chemical equations
First steps: UV breakdown the chlorofluorocarbon compound and liberate active chlorine atom(Cl)	$CFCl_3 \longrightarrow CFCl_2 + Cl$
second steps: Active chlorine atom (Cl) react with ozone molecules (O3) forming chlorine monoxide (ClO)	$Cl + O_3 \longrightarrow O_2 + ClO$ $ClO + O_3 \longrightarrow 2O_2 + Cl$
Third steps: Chlorine monoxide (ClO)react with other ozone molecule, where other active chlorine atoms liberate and play their role in destroying more amount of ozone gas.	

Protecting the ozone layer:

Montreal protocol:(to protect ozone layer)

Some of these recommendations are:

- The use of CFCs must be reduced and find safer alternatives.
- Stop producing the ultrasound Concorde planes as their exhausts affect the ozone layer.

Global warming phenomenon:

It is the continuous increase in the average temperature of the ‘s near-surface air.

The most important greenhouse gases:

1-carbon dioxide gas.

2-CFCs

3-Methane gas(CH_4).

4-Nitrous oxide (N_2O).

5-Water vapour (H_2O).

The reason for increasing greenhousegases ratio in the atmosphere:

1-Fossil fuel burning.

2-Cutting trees.

3-Forests fires.

Interpretation of the greenhouse phenomenon:

1-It permits the visible light and short-waved rays produced from the sun to pass.

2-the earth and it components absorb these rays and reemit the radiation back in form of infrared radiation.

3-The infrared radiation cannot penetrate the atmosphere because it has a long wavelength so it is kept trapped in the troposphere causing the rise in planet earth ' temperature.

Greenhouse effect:

It is the trapping of infrared radiation in the troposphere layer due to the increase in the ratio of greenhouse gases which cause the increase in temperature.

The ultraviolet radiation has a chemical effect, while infrared radiation has a thermal effect.

The negative effects of global warming phenomenon:

*Melting the ice and snow of both south and north poles:

1-coastal areas as they could drown.

2-extinction of some polar animals like the polar bear and seals.

*severe climate changes:

1-tropical hurricanes such as hurricane Katrina in 2005.

2 –destructive floods.

3-Drought waves.

4-Forest fires.

How to overcome global warming:

Kyoto protocol that suggests:

1-reducing the ratio of bad emission by cutting down consumption of fossil fuel .

2-searching for environmental friendly alternative energy resources.

worksheet :

Q. (1):choose :

1. Ozone layer is measured by a unit called ....
   (Km - Dobson - nm - mm^3)
2. All are greenhouse gases except ....
   (CO_2 - O_2 - N_2O - CH_4)
3. The ozone molecule is consist of ....
   (4 oxygen atoms – 2 oxygen atoms – 3 o atoms – 1 oxygen atoms)
4. The CFCs compounds break down under the effect of ultraviolet rays to release .... atom.
   (carbon - chloride - oxygen - Freon)
5. The ozone layer doesn't allow the passage of .... ultraviolet rays.
   (far - medium - near - a&b together)
6. .... Is used as a coolant in cooling devices.
   (Methyl bromide gas – Halons – Nitrogen oxide – Freon)
7. .... is used as insecticide to preserve stored agricultural crops.
   (Methyl bromide gas – Halons – Nitrogen oxide – Freon)

Q (2) : Mention 2 harmful effects that are caused by Global Warming

Q. (3): Put (✓) or (X) :

1. 50% of the mass of the atmospheric envelope is in some area in between sea level and a 3 km elevation ( )
2. The satellites revolve around the Earth in a region called exosphere ( )
3. The air moves horizontally in the bottom part of stratosphere ( )
4. The thickness of mesosphere is 60 km ( )
5. The ionosphere is surrounded by Van Allen's belt which is responsible for scattering the harmful cosmic rays away from Earth ( )
6. Lacking of plants on Earth will lead to increasing in temperature ( )

Q. (3): Write the scientific terms:

1. A phenomenon looks like a colorful light curtains seen in the two poles (...)
2. The atmospheric layer that contain a certain amount of helium and hydrogen gas (...)
3. The gas resulting from the reaction between chlorine atom with ozone molecule (...)
4. A phenomenon that increases the percentage of CO2 and leads to increasing in the Earth's temperature (..)
5. A region between mesosphere and thermosphere (...)

H.W

Q. (1): Give reasons:

1. The increasing in the ratio of CO_2 in the atmosphere.
2. Stop producing the Concord airplanes.
3. Formation of ozone layer in stratosphere.
4. The trading of producing CFCs compounds is prohibited.

The ozone layer is considered as the protective shield for all living organisms

Unit 3

Lesson 1 fossil

Fossil:

They are traces and remains of old living organisms that are preserved in sedimentary rock.

Trace: once of an old living indicate its activity during its life.ex:worm'tunnels

Remains: traces that indicate the remains of once an old living after death.ex: remains of adinosaur's skull

Types of fossils:

Fossils are classified according to the way of formation into several types among them are:

1-Fossil of complete body

2-Cast

3-Mold

4- petrified fossils.

1-fossil of a complete body:

Example of a complete body fossil:

A-Mammoth fossil:	B-amber fossil:
Types of elephant occurred in Siberia. It died and rapidly buried in snow it body didn't decompose.	Pine trees which secreted resinous matter that covers insects.

2-cast

a-Hollow cast: as the face mask which has the same external details of the face.

b- Solid cast : have the same internal details .

Solid cast: it is the replica of internal details of skeleton

Ex: ammonites fossil, nummulites fossil trilobite fossil.

4-petrified fossils:

They are fossils in which minerals replace the organic matter of organism part by part leaving the shape without any changes.

Examples of petrified fossils:

Dinosaur's tooth

Petrified wood are consider fossils although they look like rocks.

Bec.theygive us the detail about the life of once an old plant

Naming the petrified forest in qattamiya with wood mountain.

Bec. It contains petrified woods which look like rocks.

Petrification:

It is the process of replacing the wood material by silica to form petrified woods.

Suitable conditions for fossils formation

1-presence of hard skeleton.

2-the body must be buried immediately after death.

3-the existence of a suitable medium .

Importance of fossils:

1-age determination of sedimentary rocks:

Index fossils indicate the age of sedimentary rocks.

Because the age of rocks in the same age of fossils existed in them.

Index fossils:

They are fossils of organisms that had lived for short period of time and has wide geographic

2-figuring out the paleoenvironment:

Fossils give us an idea about the environment

Examples:

1-**Nummulites fossils:** they are found in limestone rocks of el-Mokattam mountain are they indicate this area was a sea floor more than 35 million years ago.

2-ferns fossils:

They indicate that the environment where they lived was a hot and rainy tropical environment.

3-Coral fossils:

They indicate that the environment where they lived was clear warm shallow seas.

3-Studing life evolution:

Fossil record:

Fossils exist in the rocks of different areas that indicate the extinction and evolution of organisms.

Gymnosperms ⟶ angiosperms

Fish ⟶ Amphibians ⟶ Reptiles ⟶ Birds and mammals

Archaeopteryx: link between reptiles and birds.

4-Petroleum exploration:

The suitable condition of petroleum formation:

If they contain micro fossils like foraminifera and radiolarian.

Worksheet:

Q. (1): Complete:

1. Archaeopteryx represent the link between ……………………………. and…………………………. .
2. Fossils are used in …………………… Exploration and determining the age of …………………………. .
3. Complete fossils of insects are found preserved in……………………………. .
4. …………………… is an example of microfossils.
5. The suitable medium to form a mammoth fossil is ……………………………. .
6. The fossil is a trace and remaining of living organisms ……………………… Preserved in ………………………………. .
7. By studying the fossil record it shows that ………………… started first in …………………… then established on…………………………. .

Q. (2): Choose :

1. To have a fossil of any organism, it should have……………………….

- A hard skeleton
- A medium to protect it from decomposition
- Fast burial after death
- All the above

2. On the solidification of resinous matter secreted by the pine trees in the old geological periods it forms……………………
- Petrified wood
- Amber fossil
- Trilobite fossil
- Nummulites fossil
3. Not all the fossils are considered index fossils and that's because they are characterized by ………………………
- Long range of time and limited geographical range.
- Short range of time and wide geographical range.
- Long range of time and wide geographical range.
- Short range of time and limited geographical range.
4. Which of the following fossils indicates that the environment they were formed in was a hot and rainy tropical environment
- Nummulites - Ferns
- Coral - Archaeopteryx
5. What's the kind of fossils formed when a plant leaf falls on a sedimentary rock in the beginning of it formation then it solidified.
- Trace - Cast
- Mold - Petrified wood

H.W

Q. (1): Give reasons:

1. The petrified wood is considered from fossil in spite of their resemblance to rock.
2. Gebel Mokattam was once a sea floor more than 35 million years ago.
3. The amber is considered as suitable medium to form a complete body fossil.

Q. (2): What's the difference between:

1. Trace and mold.
2. Cast and mold.

Lesson 2: Extinction

***Extinction:**

The continuous decrease without compensation in the number of a certain species of living organisms until all members dies out.

Ex.: The wild ram called Arwa ram in Egypt is threaded to be extinct.

***The moment of extinction:**

It is the date in which the last member of the extinct species dies out.

***Using fossils to indicate extinction:**

- The fossils in rocks of different areas which are known as the fossil record indicates the extinction of species of once living organisms.

- Most of them have appeared and extinct before the creation of man.

***Factors causing extinction of species:**

Scientists postulated many theories to explain the great extinction phenomenon (Mass extinction) such as:

- Meteorites that impact with Earth.
- The onset of the long glacial age.
- Poisonous gases emitted by active volcanoes.

Recent extinction that is occurring now is due to different factors, most of them are due to humane interference in nature such as:

1. ***Destroying nature habitat:***
   - Tropical forests include about one third of the terrestrial living organisms, each tree form a shelter of more than 300 species of living organisms.

- Removing forest destroys the habitat of these species and drive them stray and homeless.
- We lose 68 species of trees every day.
- Half the world's trees has become extinct since 1950, scientists expect losing a tree out of five in 2020.

2. ***Overhunting:***
   - Hundreds of reptiles and mammals species recently become extinct due to the absence of laws that control the wild animal hunting.
   - The development of the hunting weapons and the increasing interest of animals skin and furs increases the rate of hunting.

3. ***Environmental pollution:***

   Since the industrial revolution in 1750 , pollution has propagated in all ecosystem. Among those pollutions:
   - Acid rains fall and destroy forest trees.
   - Chemical insecticides that break down the food chain.
   - Oil leaks in seas and oceans.

4. ***Climatic changes and natural disasters:***

   Natural disasters such as:
   - Active volcanoes
   - High marine tide (tsunami)
   - Drought
   - Floods
   - Hurricanes

***The extinct and endangered species**

First : Extinct species:

- Since the life establishment, it witnessed 5 mass extinctions. In each of them most species extinct followed by the appearance of another more evolved types.

***Examples of some extinct animals:**

1. ***Dodo bird: (stupid bird)***
   - Bird with short leg and small-sized wing, so it's non-flying bird and can not run quickly. It is one meter long and build their nest on the ground.
   - These features make it easy for hunter to catch it, so it became extinct in 1681 in the Indian island after 50 years from man invasion.
2. ***Quagga:***
   It is a mammal, midway between horse and zebra. The last member of its species was killed in south Africa by hunters in 1883.
3. ***Passenger pigeon:***
   - Its native habitat was North America.
   - The number of its members in 1850 was billion birds (1000 million).
   - The last member died in one of the zoos in1914.
   - Its extinction was due to:
     - Cutting the oak and beech trees, where they used to build their nests.
     - Mass hunting of the bird.
     - Its female lays only one egg each spring.
4. ***Australian wild cat: (Tasmanian cat)***
   - This animal had a wolf's head, dog's tail, a pouch like Kangaroo, and striped skin like tiger.
   - The last member died in Sidney Zoo, Australia in 1936.
   - Its extinction is due to being hunted by peasants because it preys on sheep and chickens.
5. ***Golden frog:***
   The golden frog has disappeared since May 1989and has not been seen since that time.

<u>Second :</u> The endangered species:

- IUCN, the International Union for Conservation of Nature, was established in 1963 to protect the endangered species.

- It issues every year a Red List , which is a list of endangered species and its level of danger.
- The endangered levels are classified into 3 levels:
  Critically Endangered (CR)
  Endangered (EN)
  Vulnerable (VU0
- They are 5000 species.

<u>*Examples of endangered species:</u>

in 2008 the Red List includes 450 species included:

1. ***<u>Panda bear:</u>***
   - Inhabits the Bamboo forest in northeast China.
   - They are endangered because of:
     - Their weak rate of reproduction.
     - The rareness of bamboo plant (its only food) as it does not blossom except once every 100 years.
2. ***<u>Rhinoceros:</u>***
   - It is endangered because its habitat started to transformed into a cultivated lands.
   - They are hunted to use its horns for medical purposes.
3. ***<u>Bald eagle:</u>***
   - Its head is covered with white feathers, so it looks bald.
   - It is endangered because it feeds on fish that contain poisonous matter that is dumped in lakes and rivers.

4. ***<u>Ibis bird:</u>***
   - Disappeared from Aswan after the building of High Dam, due to loss of its nests.
   - This bird is still found in Upstream Nile in Africa.
   - It must be imported back to reproduce its species in the protectorates established in the Nile islands of Aswan.

- This bird was important for Pharaohs so you can see its picture in the walls of their temples, as they drank the only water from which this bird drank as it used to avoid polluted water.

5. ***Papyrus plant:***
   - Grows in swamps of the Upper Nile.
   - Pharaohs used it to make writing papers.
   - It disappeared due to the drought of these swamps.
   - It is now reproduce in Pharaonic Village in Giza (Hassan Ragab Village).

- There are also the double-dumped camel, snow tiger, blue whale, antelope deer and orangutans. They are endangered species.

*Real life app.: Fashion and extinction

Instead of hunting animals to use its skin and furs in making coats and shoes, its better to use the artificial copy of these skins and furs which looks exactly like the natural ones even cheaper.

*Effect of extinction on the geological equilibrium:

- Each living organism plays a role in transferring the energy throughout the food chain.
- When one organism disappears, its role stops, affecting the rest organisms in the food chain.

Extinction of one or more species in a balanced ecosystem caused a cavity in the ecosystem that would disturb the ecosystem or may destroy it.



➢ The ecosystem is classified according to the degree of effect of extinction on it into:

	Simple ecosystem	**Complicated ecosystem**
Members	Few members	Multiple members
Effect	Severely affected by the absence of one specie because of the rarity of alternatives that compensates this absence.	It is not affected much by the absence of a specie because it has many alternatives.
Ex.	The Desert ecosystem.	The Tropical ecosystem.

***Ways to protect living organisms from extinction:**

1. Issuing rules that control the hunting in land, seas, and air specially for the rare types.
2. Increasing the awareness about the importance of the natural life to sustain the existence of mankind.
3. Reproducing the endangered species and sending them back to their native habitat.
4. Establishing gene banks for those much endangered.
5. Establishing natural protectorates areas.

****Natural protectorates:***

➢ Safe area established to protect the endangered species in their homeland.

➢ The most recognized protectorates are:

1. ***Bluestone in USA:*** it protects the grey bear.
2. ***Panda protectorate:*** in northeast China.

3. ***Ras Mohamed protectorate:***
   - in Egypt, which contain 134 types of rare coral reefs and also contains colored fishes.
   - It is the first one in Egypt which established in 1983.
4. ***Wadi Hetan:***
   - It is part of Wadi El-Raiyan protractorate in Fayoum.
   - It contain about 205 complete whale skeleton fossils, from 406 whale skeleton fossils.
   - In 2005, the UNESCO declared Wadi Hetan as the best world heritage of whale skeletons.

Worksheet:

Q. (1): Mention the most important factors that cause species extinction now.

Q. (2): Give reasons:

1. The desert ecosystem is affected severely by the absence of on specie.

....

2. The farmers hunt the Tasmanian cat.

....

3. The dodo bird is an easy target to hunt.

./...

4. The ibis bird is considered as endangered species.

....

5. The UNESCO chooses Wadi Hetan as the best world heritage region.

....

Q. (3): What's happen when:

1. The continuous evolution of manufacturing hunting weapons.

....

2. Hunting the passenger pigeon in great numbers.

....

3. The falling of acidic rains on the trees of forests.

....

Q. (4): Mention one example of:

1. Endangered bird.
2. Endangered plant.
3. Animal habitats bamboo forest.
4. Bird habitats in North America.
5. Extinct bird.
6. Extinct animal.



Work Sheet
For Unit 1
Prep.2

Choose the correct answer between brackets:

1- ………….. form positively charged ions when they enter in the chemical reactions.
(Inert gases – Nonmetal – Halogens – Alkaline Earth metals)

2- The elements of group (7A) are called ……….
(alkali metals – halogens – inert gases – alkaline Earth metals)

3- The number of known elements is ……….
(216 – 116 – 316 – 16)

4- The number of negative electrons in the atom in its normal state equals ………
(number of protons – number of neutrons – twice the number of protons
- half the number of neutrons)

5- The atomic number of the elements equals ……………
a- The sunt of neutron numbers inside the nucleus.
b- Sum of the number of electrons which rotate in the energy levels around its atom's nucleus.
c- The number of protons inside the nucleus
d- b& c are correct.

6- The density of pure water in solid state is:
a- Less than its density in liquid state.
b- Equal to its density in vapour state.
c- Greater than its density in liquid state.
d- Greater than its density in vapour state.

7- In the periodic table, the elements which are identical in properties lie in the same:…..
(Period – Group – Nucleus – Energy)

8- The scientist who left vacancies in his table to be filled with suitable discovered elements in future is:
(Mosely — Bohr – Mendeleev)

9- The block which contains the groups 1A , 2A in the periodic table is …….
(S – P – d – f)

10- The elements which occupy the middle block (d) in the periodic table is ……… … elements.
(alkali – alkaline earth – transition – inert)

11- The scientist who discovered the main energy levels is: ………….
(Mendeleev – Bohr – Moseley – Rutherford)

12- Which of the following belongs to the same group in the periodic table?
(Na,C - Na,Li – Na,Cu - Na,Ne)

13- The scientist who discovered that the nucleus of the atom contains positively charged particles is :
(Mendeleev – Moseley – Rutherford – Bohr)

14- The element which its atomic number (18) is: ……………..
(Transitional element – Inert gas – Metallic element – Halogen element)

15- The element which its atomic number is (17) is similar in its chemical construction to the element which its atomic number is: ……………..
(2 – 7 –9 – 19)

16- The 3rd period starts with elements their oxides are as following:
a- Acidic, amphotoric then basic.
b- Acidic, basic then amphotoric.
c- Basic, acidic then amphotoric.
d- Basic, amphotoric then acidic.

17- Metal oxides are ……… oxides.
(acidic – basic – amphotoric – neutral)

18- The elements of 1st group are known as:……….
(Halogens – Inert gas – Alkalines – alkaline earth)

19- The hydrogen element belongs to: …………
(Group 1A –Group 2A – Group 7A – Group 6A)

20- The strongest alkaline earth metal in reaction with water is: ………….
(magnesium – calcium – barium – sodium)

21- The transitional elements start to appear from the beginning of the ……… period
(second - third- fourth – fifth)

22- There are …….. bonds between water and molecules.
(metallic - ionic - hydrogen – covalent)

23- The volume of hydrogen gas evolving from water electrolysis equal ……… the oxygen volume.
(that of – double- half - four times)

Complete the following statements:

1- In Mendeleev's table the elements are arranged ………. According to their atomic weight.
2- The Newzealandscientist Rutherford discovered that the atom contains …………. Of positive charge.
3- The alkali metal elements are ……….. valent.
4- Halogens lie in the elements of …………. group.
5- The two scientists ………. and ………. made modifications on Mendeleev's table.
6- Moseley put ………… and ………… series below the periodic table.
7- The D-block contains …………. Elements.
8- The transitional elements starts from ……….. period in the modern periodic table.
9- The modern periodic table consists of …………. Horizontal periods, ………… vertical groups.
10- By increasing the atomic number, the value of mass numbers will ………. in the periods of the periodic table.
11- By increasing the atomic number, the value of electro negativity ………. in the groups of the periodic table.
12- Each period in the modern periodic table starts with ………. Elements and ends with …………….. elements.
13- The strongest non-metal elements are in the ………… group.
14- Mendeleev organized the elements according to the similarity in ……
15- Sodium is kept under the surface of …… So as not to react with ……
16- The electro negativity in the modern periodic table increase from …….
to ……. Inside the same group.
17- The last level of metallic elements contains ……… than four electrons
when the non-metallic elements contain …….. than four electron in their last level.
18- The elements of group 7A are called ………
19- The bond between water molecules is called …….. bond.

Write the chemical equations representing the following:

1- Dissolving of magnesium oxide in water.
2- The reaction between chlorine gas and potassium bromide.
3- The electrolysis of water

Mention one difference between each of:

1- Flourine molecule and helium molecule.
2- Natural and industrial water pollutants.

Give reasons:

1- Water molecule is from the polar molecules.
2- Sodium is kept in kerosene.
3- Fluoride is considered from the strongest non-metallic elements.
4- Cesium is considered from the strongest metallic elements.
5- Sulphur dioxide is considered as basic oxide.
6- Aluminum oxide is considered an amphotoric oxide.
7- By increasing the atomic number of the elements their atomic weight decrease.
8- Starch (NH3) is considered as ionic-covalent compound.
9- It's hard to identify the properties metalloids from their electronic structure.
10- Rain, clouds, winds are in the troposphere.
11- Liquefied nitrogen is used in preserving cornea.
12- Barium oxide is considered as basic oxide.

Write brief notes on:

1- The relation between water density and its temperature.

Put (√) in front of the correct answer and (x) in front of the wrong ones in the following:

1- The alkaline earth metals are good conductors of heat and electricity. (   )
2- Halogens are univalent metals. (   )
3- The elements are arranged descendingly according to their atomic weight in the modern periodic table. (   )

4- The chemical elements have been categorized in a table to ease its studying. ( )

5- The elements with the same physical and chemical properties has been put in horizontal periods. ( )

6- Mendeleev arranged the elements descendingly according to their mass. ( )

7- Mendeleev put more than element in the same place like Nickel and cobalt. ( )

8- Rutherford discovered that the nucleus contains +ve charged protons. ( )

9- The atomic number of every element increases by one over the element that precedes it in the same period. ( )

10- Bohr had discovered the main energy levels. ( )

11- The transitional elements group are symbolized by (d). ( )

12- The number of known elements till now is 92 elements. ( )

13- The atomic size increase in periods as the atomicnumber increase. ( )

14- In water molecule the oxygen element has more affinity to attract thebonding electrons than the hydrogen element. ( )

15- The covalent bond becomes ionic when the difference in electro negativity between the bonded atom = zero. ( )

16- It is easy to identify the semi-metals from their electronic structure. ( )

17- Each period starts with a weak metal. ( )

18- The metallic property in group (1A) increase as we go from up to down in the group. ( )

19- 50 % of the mass of the atmospheric envelope is in some area in between the sea level and 3 Km elevation. ( )

20- The earth alkalines are good heat conductors. ( )

21- The elements of block "P" are organized in 5 groups ( )

22- The halons are produced from supersonic airplanes. ( )

23- The elements of the group (1A) and (2A) are good conductors for heat and electricity. ( )

Write the scientific term for the following statement:

1- Elements layer at which the air moves vertically.
2- An atom lost or gained one electron.
3- A bond that exists between water molecules.
4- The ascending order of the element according to their atomic mass.
5- The ascending order of the element according to their atomic number.
6- The horizontal rows in Mendeleev's table.
7- The vertical column in Mendeleev's table.
8- Indicated by the letters K, L, M, N, O.
9- Indicated by the letters S, P, d, F
10- A kind of elements symbolized by letter (B)
11- The block that contains the group from 3A to 6A.
12- The block that contains the series of luthanides and actinides.
13- The ability of the atom in the covalent molecule to attract the chemical bond electron to it.
14- A kind of oxides react as basic oxides or acidic oxides according to the reaction condition.
15- A kind of elements in which their valency electrons contains less than 4 electrons.
16- A kind of elements in which their valency electrons contains more than 4 electrons.
17- A group contains the strongest non-metal.
18- The block that contains the group from 3A to 7A.
19- The ability of the atom in covalent molecule to attract the chemical: bond electrons to it.
20- Elements in block "S" and they are dicovalent and lie in the second group of the periodic table.

Compare between the following

1- Alkalies and earth Alkalies.

2- The group and the period in the periodic table.

3- The property of the atomic volume and the property of the electro negativity in the periodic table (in view of definition)

Connect the underlined word(s)

1- The elements in Mendeleev's table are arranged according to the atomic number.

2- Rutherford discovered the main energy levels.

3- The elements were arranged in Moseley's table according to the way the energy sublevels were filled.

4- The electro negativity values increase in the groups as atomic number increase.

5- Each period ends with a non-metal.

6- The strongest non-metal element occurs in the 1st group (1A).

7- Non-metal oxides are considered basic oxides.

8- The elements of the 1st group (1A) are known as basic earth metal.

General exercise for unit two

Choose the correct answer:

1-Meteors are formed in.................. (exosphere-thermosphere –mesosphere-stratosphere)

2-The hottest atmospheric layer is............... (exosphere-thermosphere –mesosphere-stratosphere)

3- The coldest atmospheric layer is .... (exosphere-thermosphere –mesosphere-stratosphere)

4-The planes fly in the .... layer .(exosphere-thermosphere –mesosphere-stratosphere)

5-The device used in measuring the atmospheric pressure is : (Altimeter-Aneroid-Barometer – a and b)

6-................. layer extends from the sea level to the tropopause.

(.(exosphere-thermosphere –mesosphere-stratosphere)

7- The device used in measuring the altitude from the earth surface is ....(the altimeter – aneroid –barometer –a and b)

8-The .... Layer extend from the tropopause to the stratosphere.

.(exosphere-thermosphere –mesosphere-stratosphere)

9-The charged cosmic radiations are dispersed in the .... Layer.

(thermosphere –mesosphere-stratosphere-ionosphere)

10- The .... layer extends from the stratopause to the meso pause.

(troposphere –stratosphere –mesosphere-thermosphere)

11- The .... is much vacuumed layer .

(troposphere –stratosphere –mesosphere-thermosphere)

12-The temperature decreases by .... at 2Km above earth surface.

(6.5^0C- 13^0C-5.6^0C-9.75^0C)

13-The atmospheric pressure is the .... Of an air column per a unit area.

(mass –volume – weight – density)

14-Meteors are burnt in the layer ....(troposphere –stratosphere-mesosphere – thermosphere)

15-The ionosphere is located in the upper part of the .... Layer.

(troposphere –stratosphere-mesosphere – thermosphere)

16-The air moves ....in the stratosphere layer.

(Horizontally –vertically –no correct answer)

17-The ionosphere is surrounded by two .... belts.

(magnetic – electrical –ionic –thermal)

18-The atmospheric pressure on the top of a mountain .... the atmospheric pressure at the sea level.

(is greater than –is less than –equals –equals half of)

19-The standard atmospheric pressure at the sea level is ....millibar.

(76 – 1000 – 1013.25 -1300)

20-The .... is considered the 1st atmospheric layer of the atmospheric layer.

(troposphere –stratosphere-mesosphere – thermosphere)

21-The ....is considered the 2nd atmospheric layer of the atmospheric layers.

(troposphere – stratosphere –mesosphere – thermosphere)

22-The ozone layer is in the ....

(troposphere – stratosphere –mesosphere – thermosphere)

23-The ozone molecule consists of ....

(4 oxygen atoms -2oxygen atoms – 3 oxygen atoms one oxygen atom)

24- The ozone layer absorbs ....

(infrared rays –U.V- X-rays –light rays)

25-The ozone hole appears over ....

(the north pole –the south pole –the middle east)

26-The .... is used in extinguish fires.

(methyl bromide gas –halons –nitrogen oxide – U.V rays)

27-The CFCs compound break down under the effect of ultravioler rays to release .... atoms.

(carbon – chloride – oxygen – Freon)

28-.................. Is considered one of the chlorofluorocarbon compounds.

(ozone – oxygen –water vapour –nothing)

29-The ozone layer doesn't allow the passage of ....U.V rays.

(far –medium –a and b – near)

30- .... Are considered to have a large thermal effect.

(infrared rays – visible rays –U.V RAYS- all the above)

31-The ozone hole increases in .... of each year.

(October – September – December – January)

32-................ is used as a coolant in cooling devices.

(methyl bromide gas – halons – nitrogen oxide Freon)

33-............... Is used as an insecticide to preserve stored agricultural crops.

(methyl bromide gas – halons – nitrogen oxide Freon)

34- .... results from the burning fuel of ultrasound airplanes (concord)

(methyl bromide gas – halons – nitrogen oxide Freon)

35 –From the negative effects of global warming is ....

-melting of ice at 2 poles.

-severe climatic changes

-the lack of ozone gas

A and b

36- Global warming happens because of ;

- The lack of co2 in the atmospheric envelope.
- The increase of the amount of co2
- The lack of plants on earth.
- B and c

37-The ozone is measured by a unit called ....

(millibar –km-dopson)

38-The increase of co2 is caused by ....

(cutting trees –burning forests – burning fossil fuel –all above)

Complete the following :

1-The thickness of troposphere is about ....

2-As we go up 1 km above the sea level the temperature .... with ....

3- The atmospheric pressure at sea level equals .... millibar.

4- The aneroid is used to ....

5- The stratosphere extends with thickness equals .... km.

6-On the formation of ozone layer the oxygen molecules absorbs ....which breaks the bond between .... To make each atom bonds with .... Forming the ozone molecules.

7-The U.V rays are three kinds ....,.......................,..............

8- From the harmful effects of far and medium U.V rays on human are ....,.......................,....................

9-- From the harmful effects of far and medium U.V rays on amphibians are .... and ....

10--- From the harmful effects of far and medium U.V rays on marine organisms are .... and......................

11-From the harmful effects of far and medium U.V rays on earth plants are .... ,......................,..................

12- The ozone gas is formed in two steps: ....

....

13- ....,............... and................ are considered from ozone layer pollutants.

14-..................... Is used as insecticide to preserve the agriculture storage.

15-When the density of green house gases increase in earth 's atmospheric envelope it allows the passage of .... and ....

16- .... and .... are from Montreal protocol commandments.

17- The global warming phenomenon means ....

18- The nanometer equals .... Meter.

19- The glass permits the passage of .... and .... rays coming from the sun to be absorbed by earth in the green house .

20- The lights in Eiffel tower, light and sound project in Abu simbel temple Aswan and other monuments are turned off in the ……………………… Day.

20-

Atmospheric layer	its order	thickness	content
………………	third	………………..	………………
2- the stratosphere. 3-……….	………….. …………	…………. 590km	………….. …………..

Put (√) or (x)

1- 50 % of the mass of the atmospheric envelope is in some area in between the sea level and a 3 km elevation.
2- The troposphere is the 1st layer in the atmospheric envelope.
3- All the atmospheric phenomena like rain, wind and clouds accur in the ionosphere.
4- The mesosphere is the coolest region in the atmospheric envelope.
5- The satellites revolve around the earth in a region called the exosphere.
6- The standard atmospheric pressure at sea level equals76 millibar.
7- The temperature in the troposphere decrease at a rate of 6.5 degree each 1 km up.
8- The ionosphere is surrounded by van Ellen's belt which is responsible for scattering the harmful cosmic rays away from earth.
9- The stratosphere is the 3rd layer in the atmospheric envelope.
10- The air moves horizontally in the bottom part of the stratosphere.
11- The troposphere contains most of the atmospheric envelope.
12- The altimeter is used to determine the elevation of airplanes from the sea level.
13- The aurora phenomenon appears as colored light curtains at the north and south poles.
14- The pilots prefer to fly their airplanes in the upper layer of the mesosphere.
15- The air moves vertically in the stratosphere.

16- The ozone layer is in the stratosphere.
17- The millibar is the unit of measuring the ozone degree.
18- The increase of carbon dioxide percentage in the atmospheric envelope leads to the increase in temperature.
19- Lacking of plants on earth leads to the increase in temperature.
20- The extinction of some polar animals is from the negative effects of global warming.
21- The ozone layer allows the passage of all U.V rays near and medium
22- The ozone layer acts as a protective shield for the living organisms.
23- The halons are produced from the burning of supersonic airplanes fuel.
24- The world celebrates the ozone day in December of each year.
25- Methyl bromide is used in extinguishing fires.
26- Nitrogen oxides results from fuel burning .
27- The ozone layer erosion differs every year.
28- The methane gas and nitrous oxide are consider from the green house gases.
29- The ozone molecules is formed by bonding three free oxygen atoms together.
30- The ozone layer lies at altitude from 20-30 km.
31- The far and medium U.V rays cause skin cancer and cataract to humans.
32- The Freon is used as a coolant in cooling devices.
33- Methyl bromide is used as an insecticide.
34- The U.V rays break CFCs to release active chlorine atoms.
35-

Write the scientific term:

1- A region between mesosphere and thermosphere.
2- The 4th layer of the atmospheric envelope.
3- A device used to measure the altitude from earth's surface.
4- A layer of the atmospheric envelope in which air moves vertically.
5- Two magnetic belts help in dispersing the harmful cosmic radiation away from the earth.
6- A phenomenon looks like a colorful light curtains seen in the two poles.

7- The atmospheric envelope layer that contains a certain amount of helium and hydrogen gas only .

8- The region where the atmospheric envelope merges with the outer space.

9- A phenomenon that increase the percentage of carbon dioxide and leads to an increase in temperature.

10- A kind of gases formed in the stratosphere .

11- The gas resulting from the reaction of a chlorine atom with ozone gas.

12- A kind of rays causes the rising of temperature in the troposphere layer.

column (a)	column (b)
1-altimeter	a- A device used to determine today's weather.
2-aneroid	b-a suitable layer for air planes flying.
3-troposhere	c-A device used to measure the altitude of planes.
4-thermospher	d-the hottest layer in the atmospheric envelope.
5-stratosphere	e-the layer that has all the weather phenomena.
6-mesosphere	f- the coolest layer in the atmospheric envelope.

Give reasons:

1-rain,clouds and winds are in the troposphere.

2-The ionosphere is very important to radio stations.

3- The occurrence of aurora phenomenon.

4-The temperature increase as we go higher in the stratosphere.

5-The continuity of ozone layer erosion.

6-The ozone layer acts as a protective shield for the living organisms.

7- The increase of the carbon dioxide percentage in the atmosphere envelope.

8- The trading or producing CFCs compound is prohibited.

compare between the following:

Altimeter and aneroid.

The troposphere and ionosphere layer.

The mesosphere and thermosphere.

The atmospheric pressure and atmospheric envelope.

What is the important of:

1-The two van Ellen's belt.

2-ozone layer.

3-altimeter.

4-ionosphere.

5-satellites.

6-mesosphere.

7- troposphere.

8- exosphere.

9- aneroid.



Questions on unit 3

Prep. 2

Q.(1): Choose the correct answer:

1. Which of the following terms is more precise in describing the remains and traces of old living organisms preserved in sedimentary rocks
   (extinction - the red list - fossils - solidification)
2. To have a fossil of any organism, What do you expect to be available to it?
   (a hard skeleton - a medium to protect it from decomposition - fast burial after death - all of them)
3. On the solidification of the resinous matter secreted by pine trees in the old geological periods it forms..................
   (fossils of complete body - amber fossil - trilobite fossil - nummulites fossils)
4. Worms tunnel fossils are formed because ....
   a) The activity of worms during their life.
   b) The death of the worms and their fast burial in sedimentary rocks.
   c) The death of the worms and their fast burial in snow.
   d) The presence of hard skeleton.
5. What's the kind of fossils formed when a plant leaf falls on a sedimentary rock in the beginning of its formation then it solidified.
   (trace - cast - mold - petrified fossil)
6. The fossils exist in the sedimentary rocks of Mokattam Mountain are.....................
   (ferns - coral - nummulites - foraminifera)
7. Is the dinosaur's egg an example for petrified fossil?
   a) Yes because minerals replaced its organic materials part by part.
   b) Yes because it holds the inner details of the egg.
   c) No because it isn't considered as a fossil.
   d) No because it doesn't indicate the remains of dinosaur.
8. What happen when silica replaces the wood of the trees...........
   a) A complete body fossil has been formed.
   b) A petrified fossil has been formed.
   c) A trilobite fossil has been formed.

9. Not all of the fossils are considered index that is because they are characterized by ....
   a) Long range of time and limited geographical range.
   b) Short range of time and wide geographical range.
   c) Long range of time and wide geographical range.
   d) Short range of time and limited geographical range.
10. Which of the following fossils indicates the environment they were formed in was a hot and rainy tropical?
    (nummulites - ferns - coral - archaeopteryx)
11. Which of the following fossils play an important role in petroleum exploration?
    (foraminifera and radiolarian - nummulites and ammonites - foraminifera and trilobite)
12. Which of the following terms is more precise in describing the concept of extinction?
    a) The date of death of the last one of the same species.
    b) The continuous decreasing in the numbers of individuals of the same species without compensation.
    c) Everything involves the living organisms and non-living organisms in some environment.

Q.(2): Complete:

1. The suitable medium to form a mammoth fossil is ....
2. Fossil are always found in ....rocks.
3. Resinous was secreted by ....trees which were common during some.....................geological periods.
4. When the snail's shell decomposes ....which carries the internal details of the snail.
5. By studying the fossil record it shows that life started in ....then established on ....
6. Extinction is the continuous decreasing in the .... of .... of the same species without ....
7. Removing forests leads to ....and.....................
8. The demanding of many people on fur and skin of animals led to the ....of hundreds of kinds of ....and ....

Q.(3): Mention the difference between:

1. Simple and complicated ecosystem.
2. Cast and trace.
3. Ferns and coral fossils.
4. The nummulites and foraminifera fossils.
5. The benefits of Ras-Mohammed protectorate and Waadi Hetan region.

Q.(4): What's meant by:

1.Fossil 2.Extinction 3.Petrification

4.Trace 5.Mold

Q.(5): Give reasons:

1. The bald eagle is endangered species.
2. The amber is considered as a good medium to form a complete body fossil.
3. The danger of removing the tropical forests on the life of living organisms.
4. The desert ecosystem is affected by the absence of one species.
5. The danger of overhunting on wild animals.
6. The farmers hunted the Tasmanian cat.
7. The dodo bird was an easy target to be hunted.
8. The rhinoceros is considered as endangered species.
9. Some nations stared to make natural protectorate.

Q.(6): Correct the underlined words:

1. The archaeopteryx fossil is a kind of extinct elephant.
2. The trace is a copy of the outer shape of the shell.
3. The trace is what the living organism leave after its death in sedimentary rocks.
4. Petrified wood is considered from rocks.
5. The nummulites fossil is used for indicating the age of sedimentary rock.
6. The ammonite fossil indicates that the environment it lived in was warm, clear and shallow seas.



7. The ferns indicate that the environment was a sea floor.
8. The desert environment contains almost third of the living organisms on land.
9. The Quagga is the most famous extinct kinds in the old times.
10. Dinosaurs are the most famous extinct kinds recently.
11. The passenger pigeon is from the birds that can't fly because of its small wings.
12. The red list contains 5 thousands extinct kinds in 2008.
13. The environment system is a save place which is specified to protect the endangered species in their natural environment.

Q.(7): Write the scientific terms:

1. The traces and remains of old living organisms which are preserved in sedimentary rocks. (..)
2. Fossils that indicate the activity of living organisms during its life. (..................................)
3. The traces that indicate the remains of old living organisms after their death. (....................................)
4. The process of conversion of the part of old living organisms into solidified materials as a result of replacing the organic materials of the organisms with minerals. (..)
5. Fossils of old organisms lived for short time and in a wide geographical range. (..)
6. The continuous decreasing in the numbers of individuals of the same species without compensation. (....................................)
7. Hunting wild animals with a random unorganized way which exposes them to extinction. (.......................................)
8. The environment which affected severely by the absence of one species of the living organisms that live in it. (..)
9. The environment which is not affected severely by the absence of one species of the living organisms that live in it. (..)
10. Save places that are specified to protect the endangered organisms in their natural environment. (..................................)

Q.(8): What will happen if:

1. Dipping of old insects in amber.
2. The solidification of mineral sediments inside the ammonite.
3. Putting the clams shell on the surface of a piece of clay then pressing it gently.
4. The continuous evaluation in manufacturing hunting weapons.
5. Hunting the passenger pigeon in great numbers.
6. Extinction of species from a balanced ecosystem.
7. The falling of acidic rains on the trees of the forest.
8. The low rate of reproduction of passenger pigeon.

Q.(9):Mention one example:

1.Trace 2.Cast 3.Petrified fossil 4.Solid mold

5.Complete body fossil 6.Endangered bird 7.Extinct bird

8.Endangered plant 9.Microscobic fossil 10.animals lived in bamboo forest

Q.(10): Put (√) or (X):

1. There are fossils of complete insects kept in amber. ( )
2. The index fossil indicates the age of sedimentary rocks. ( )

Revision for practical exam

Experiment (1)

Metal with dilute acid :

Observation:

1- Gas evolve with bubbles.
2- No gas evolves.



Conclusions:

$Mg + 2 HCl \longrightarrow MgCl_2 + H_2$

$Cu + HCl \longrightarrow$ no reaction

Experiment (2)

Observation:

Bubbles barium greater than calcium.

Bubbles calcium greater than magnesium.



Conclusions:

Ba > Ca > Mg

Experiment (3)

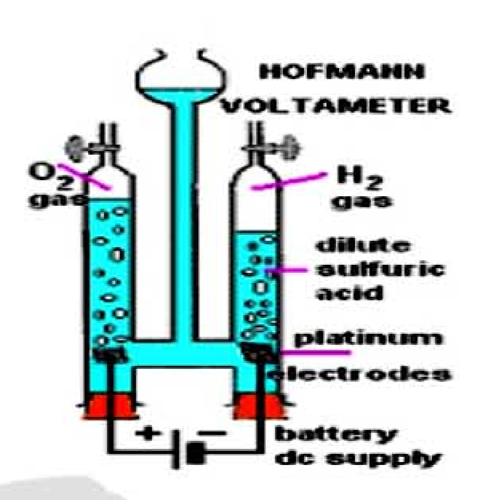
Hoffman voltmeter

Observation:

oxygen half hydrogen.

Conclusions:

$2H_2O \longrightarrow 2H_2 + O_2 \uparrow$



Experiment (4)

Reaction of alkali metals with water .

Observation:

Sodium float on surface and produce hydrogen gas and produce bomb.

Conclusions:

$Na + 2H_2O \longrightarrow 2NaOH + H_2 \uparrow$



Experimen (5)

Dodo bird (extinct)

Passenger pigeon(extinct)

Quagga (extinct)

Rhinoceros (endangered)

Panda (endangered)



